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Single-Board Computer Updates Status of Emergency Equipment on Dynamic Map

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When dispatching emergency equipment to a fire or an accident scene, speed saves lives. And Funsten Scientific Corp., making its goal an economic, efficient yet versatile dispatch system, developed LIFE-1: Log Inventory of Fire and Emergency Equipment.

Basically an intelligent map that monitors and records the changing location and status of various pieces of emergency equipment, LIFE-1 takes inputs in two forms. When on a call, each vehicle's operator activates a transmitter connected to "Reporter II," a mobile-data communications device built by Coded Communications, Inc. This data, when received at the dispatch center, identifies the particular vehicle and updates the LIFE-1 system file with the new status.

But if such links fail, system operators can manually update the inventory file using CRT consoles. Thus, system operators watching the map can, when requests come in, dispatch the closest available unit.

Map acts as a true write-only-memory

The map itself consists of a 4x5-ft sheet of black anodized aluminum with cut-outs for a



Showing the location and status of pumpers in a section of northern St. Louis County, this LIFE-1 map also displays the status of the region's fire chiefs (in the upper left-hand corner). Below the map, a card file helps dispatchers find the nearest fire station when given any particular address. (Funsten Scientific Corp., 1268 Ferguson Ave., St. Louis, MO 63133. Phone (314) 721-0693.)

4-digit, 0.3-in. red LED display at the location of each firehouse in the district. A clear plastic map printed with a white-line street map overlays this assembly and a sheet of protective sheet glass lies on top of the plastic. The map therefore shows the entire dispatch district, its streets and highways and the fire stations in the home district—as well as support stations in neighboring districts.

The left three digits of each firehouse display identify vehicles by number. A fourth digit, slightly spaced apart at the right and ranging from zero to nine, indicates unit status (available, en route, very busy, returning from a call, out of service, etc.).

Additionally, a single-character yellow display near the top of the map indicates the type of equipment currently being shown on the map with these codes: A (ambulances), E (emergency vehicles), P (pumpers) and S (special equipment, such as aerial ladders).

For example, when using the P cycle, the ID numbers and status of all pumpers in the district appear. Operators using CRT terminals can also search the system inventory for the status of any particular unit (when its location is known), add equipment to the file, delete equipment and move units from one house location to another.

Because the system's controller, an Intel SBC 80/10, assigns addresses to the map beyond on-board memory locations, the μ P moves data directly from files to the map. LED's on the map then latch onto these values, therefore acting as a "write-only-memory." As new information arrives from active units, the μ P updates its file, and the map as well.

So complete, programming's all you need

Commenting on how he chose to use a μ P, Funsten's president Bert Sterbenz said, "During early system design we knew immediately that mini's were prohibitively expensive. But we also realized that pure hardware implementations would be costly and unwieldy. Then, just before we threw up our hands, μ P's entered the scene

offering an alternative viable in both cost and implementation.

"We now encountered what turned out to be the biggest roadblock in developing this system: We started with a microcomputer-system kit and experienced nothing but problems, including software that wouldn't work, hardware design bugs and inadequate supplier support. So, after several months we found ourselves way behind schedule and losing money on the contract.

"About that time Intel introduced its SBC 80/10—a preassembled, tested inexpensive unit that needed little more than programming to specialize it for our application. We obtained an early copy, and from that point on, development moved at a rapid pace."

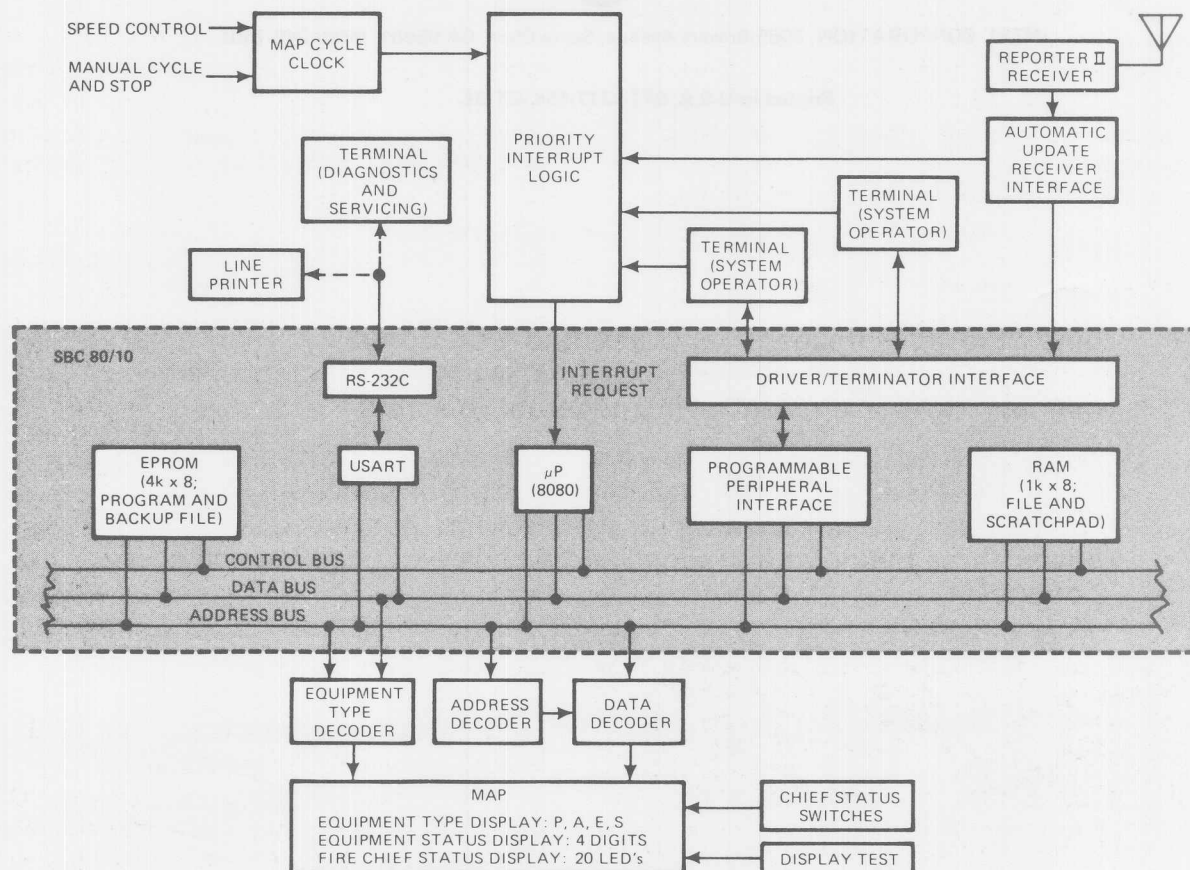
Computer memories unburden busy operators

North Central St. Louis County Fire Alarm, Inc., a nonprofit dispatch center operating the first installed LIFE-1 system, watches over 13 fire protection districts which cover 185 sq. mi, have a total population of 385,000, and house 45 emergency units in 33 engine houses. LIFE-1 replaces a rudimentary cardboard-and-pin status/location map currently used by many such agencies. Chief

dispatcher Jim Perkins explained that before this system arrived, "Our operators needed an incredible memory. Each dispatcher had to know the status of each unit; but when things got busy, one dispatcher would take a status-update telephone call and other dispatchers would not be aware of the change immediately. With LIFE-1, a dispatcher merely looks at the map and in two seconds he's absolutely certain of a vehicle's location and status.

"The old system required many time-consuming dispatcher duties such as logging all status changes. LIFE-1 does this all automatically, freeing operators for dispatch duties. This year we expect to get 18,000 calls; our present staff could handle at most 20,000 calls with the old system. Now we anticipate handling 40,000 calls with no trouble."

Perkins noted that at first North County Fire Alarm evaluated minicomputer systems for this application, but a quarter-million dollar price tag was prohibitive. And although such a system (with sophisticated data banks) may come later, this first step (costing a mere \$75,000 so far including mobile equipment) provides a quantum-leap in efficiency and reliability. □



Because the SBC 80/10 addresses data to the various displays, it releases the I/O for the many important communications links required. In addition, an EPROM backup file preserves status information during sudden power failures.



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